Introduction

This report is designed to meet the requirements for quarterly reporting for the FCC's Rural Healthcare Pilot Program as described in FCC Order 07-198 for the period ending 7/31/08 for the North Carolina Telehealth Network (NCTN). The report format is modeled after the reporting requirements in the order.

Project Scope Reform

The conditions in the final order (07-198) that defined the RHCPP provided impetus for a change in the NCTN's scope and goals. The original NCTN proposal was designed to build up a complete IT-based infrastructure in support of public health agencies and free clinics in only one region of the state. The proposal depended on funding discounts of 85% from the RHCPP for all of the elements, availability of 15% matching from vendors, and 85% RHCPP-provided discounts for program management activities. The final order's conditions would not allow for any of these key elements of the original proposal. The final order also provided an opportunity to obtain 85% discounts for broadband infrastructure/services from a variety of sources and allowed for the expansion of eligible sites beyond the original proposal.

We, therefore, explored how to reform the proposal to meet the needs of the local public health agencies and free clinics by way of providing broadband facilities/services that would be eligible for RHCPP discounts. We also sought a new means of obtaining the 15% matching from eligible sources and funds for program management. The exploration revealed that most local health departments and the free clinics across the state had broadband connections that were not going to be adequate to meet their upcoming needs. Notably:

-Most local health departments are planned to convert in 2008-2009 to a new EMR system that is centrally served in the state and whose requirements for bandwidth and reliability are not going to be met by most of the current network service in place.

-The local health departments are increasingly meant to use information services that are centrally served from Raleigh to support disaster response. In NC these disasters are typically hurricanes, ice storms, tornadoes, floods. But, very few public health agencies have broadband connections that can be depended on in such disasters.

-The NCAFC members plan to convert to a new centrally served EMR in 2008-2010 period and to make significant use of voice-over-IP services to reduce costs and improve voice service. But, very few NCAFC members have broadband connections that have the bandwidth, latency control, and reliability demanded by these applications.

The result of our exploration of the opportunities in the RHCPP's final order and the upcoming broadband needs of the public health agencies and free clinics in the state was to reform the project's goals as follows:

-We will seek to provide broadband services to all eligible local public health agency sites in NC and all eligible NCAFC member free clinics sites in the state. This is approximately 240 sites. We are also seeking to add the few (10-15) federally funded rural health clinics in the state as participants, but are not yet sure about their participation. Together this scope will include all of the RHCPP eligible sites (that we know of) in the state except for non-profit hospitals. As of this writing all of the local health agencies in NC except for one have registered sites with us in preparation for this and most of the NCAFC sites have registered with virtually all of the rest expected to do so soon.

-In designing the network we plan to make use of a small amount of seed funding from the NC Division of Public Health ($125K) to pay for the 15% matching funds for forming an RFP for network design, 15% matching funds for carrying out the network design, and funds for the design phase program management activities. We expect this network design phase combined with the time needed to competitively bid for a network implementer/operator to take about 6-9 months.

-In the implementing and operating phase of the network's life (approx 4 years long) we plan to use a subscription model in which the eligible sites provide the 15% matching funds and a small fee to support program management activities from their operating budgets. Given the expected number of sites and our current estimates of the cost per site, we can expect to spend all of the RHCPP-based funding over the 4 operational years (i.e. the life of the RHCPP).

- We plan to form the network in a way that the best technologies can be used at each site while employing a single integrated network management facility. This is intended to assure that the technical and administrative load at the sites (which typically don't have onsite technical support) is kept to an acceptably low level while network performance and reliability are kept at a high level.

-During the design phase and early operating phase, we will explore whether creating a new 501c3 with members from the eligible participants would be an appropriate way to support the long term needs of an NCTN. If agreed to, this NCTN Association would be created during the life of the RHCPP and continue thereafter. The NCTNA is likely to be a key part of the sustainability plan for the NCTN.

While this new formulation of the project is, at one level, different from the original proposal, the key insights on which the original proposal was founded are still valid and are satisfied by the reformed project. Notably, the original project was built on the conviction that successful use of networked health IT depends on adequate efforts in three dimensions: 1) Applications – that are compelling to prospective network users 2) Access – availability of affordable and properly conditioned broadband services and 3) Advertising/training – getting the word out about the benefits of network usage and supporting usage. The reformed project is positioned to succeed in these three dimensions.

The remaining comments about status below are provided with this reformed scope for the project in mind.

1. Project Contact and Coordination Information

a. Identify the project leader(s) and respective business affiliations.

The project's coordinator is Dr. William F. Pilkington in his role as the Director of the Cabarrus Health Alliance and the lead agency for the NC Southern Piedmont Partnership for Public Health. Mr. David Kirby, President of Kirby Information Management Consulting, LLC is the Assistant PC. Mr. Jason Baisden, CTO for the NC Association of Free Clinics is an active participant representing the NCAFC members.

b. Provide a complete address for postal delivery and the telephone, fax, and e-mail address for the responsible administrative official.

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c. Identify the organization that is legally and financially responsible for the conduct of activities supported by the award.

The Public Health Authority of Cabarrus County (d.b.a Cabarrus Health Alliance)

d. Explain how project is being coordinated throughout the state or region.

The NCAFC represents the free clinics in the state both generally and for the purposes of this project.

The local health departments who are participating in the state are to be formally represented by CHA (Cabarrus Health Alliance). The NC Association of Local Health Directors and the NC Division of Public Health are also significantly involved in the project as coordinating organizations for the local public health departments. The four NC projects that are RHCPP participants have agreed to form an informal group to meet quarterly to better coordinate their efforts.

2. Identify all health care facilities included in the network.

a. Provide address (including county), zip code, Rural Urban Commuting Area (RUCA) code (including primary and secondary), six-digit census tract, and phone number for each health care facility participating in the network.

We now have a nearly complete set of raw data on virtually all of the approximately 240 sites that are candidates for the NCTN (and for discounted services). The labor-intensive process of adding RUCA and census tract codes has not been completed. We have not included the detailed list here in this report in the belief that we should wait until we have all of the data well organized and have signed Letters of Agency and NCTN subscription agreements from the sites before doing so. If you would like to see an informal list of this large number of sites, we'd be glad to provide it if requested.

b. For each participating institution, indicate whether it is:

i. Public or non-public;
ii. Not-for-profit or for-profit;
iii. An eligible health care provider or ineligible health-care provider with an explanation of why the health care facility is eligible under section 254 of the 1996 Act and the Commission's rules or a description of the type of ineligible health care provider entity.

All of the approximately 240 sites in the NCTN are planned to be operated by local (i.e. non-state) North Carolina public health agencies and free clinics (501c3 type organizations). Our NCTN registration data indicates that they all will be engaged in

eligible usages of the broadband facilities. There may be a de minimus number of sites that wish to share broadband facilities with non-eligible entities (e.g. a county local health agency sharing with other county government departments). For these "shared" sites we plan to use a "fair share" approach to discount requests. Our reading of the Act and the 07-198 order lead us to conclude that all of the NCTN sites will be therefore eligible for discounted broadband services. Moreover, we do not plan to include non-eligible entities in the network.

3. Network Narrative: In the first quarterly report following the completion of the competitive bidding process and the selection of vendors, the selected participant must submit an updated technical description of the communications network that it intends to implement, which takes into account the results its network design studies and negotiations with its vendors. This technical description should provide, where applicable:

a. Brief description of the backbone network of the dedicated health care network, e.g., MPLS network, carrier-provided VPN, a SONET ring;
b. Explanation of how health care provider sites will connect to (or access) the network, including the access technologies/services and transmission speeds;
c. Explanation of how and where the network will connect to a national backbone such as NLR or Internet2;
d. Number of miles of fiber construction, and whether the fiber is buried or aerial;
e. Special systems or services for network management or maintenance (if applicable) and where such systems reside or are based.

We have not completed the competitive bidding process as of the due date of this report.

4. List of Connected Health Care Providers: Provide information below for all eligible and non-eligible health care provider sites that, as of the close of the most recent reporting period, are connected to the network and operational.

a. Health care provider site;
b. Eligible provider (Yes/No);
c. Type of network connection (e.g., fiber, copper, wireless);
d. How connection is provided (e.g., carrier-provided service; self-constructed; leased facility);
e. Service and/or speed of connection (e.g., DS1, DS3, DSL, OC3, Metro Ethernet (10 Mbps);
f. Gateway to NLR, Internet2, or the Public Internet (Yes/No);
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g. Site Equipment (e.g., router, switch, SONET ADM, WDM), including manufacturer name and model number.
h. Provide a logical diagram or map of the network.

No sites are connected to the network as of this time.

5. Identify the following non-recurring and recurring costs, where applicable shown both as budgeted and actually incurred for the applicable quarter and funding year to-date.

a. Network Design
b. Network Equipment, including engineering and installation
c. Infrastructure Deployment/Outside Plant
i. Engineering
ii. Construction
d. Internet2, NLR, or Public Internet Connection
e. Leased Facilities or Tariffed Services
f. Network Management, Maintenance, and Operation Costs (not captured elsewhere)
g. Other Non-Recurring and Recurring Costs

No funds of any type have been expended of the types listed above. For future reference, it would help us to know whether this reporting entry is limited to costs for which we have received RHCPP discounts or you want to see all costs paid with funds from any source. Please advice.

6. Describe how costs have been apportioned and the sources of the funds to pay them:

a. Explain how costs are identified, allocated among, and apportioned to both eligible and ineligible network participants.
b. Describe the source of funds from:
i. Eligible Pilot Program network participants
ii. Ineligible Pilot Program network participants
c. Show contributions from all other sources (e.g., local, state, and federal sources, and other grants).
i. Identify source of financial support and anticipated revenues that is paying for costs not covered by the fund and by Pilot Program participants.
ii. Identify the respective amounts and remaining time for such assistance.

d. Explain how the selected participant's minimum 15 percent contribution is helping to achieve both the selected participant's identified goals and objectives and the overarching goals of the Pilot Program.

As noted above, there have been no actual costs of any type to report to date that relate to the items listed in this question. The "Project Scope Reform" section above does describe the funding sources and uses that we plan to finance the network during the RHCPP's life. That text is repeated here:

-In designing the network we plan to make use of a small amount of seed funding from the NC Division of Public Health ($125K) to pay for the 15% matching for forming an RFP for network design, 15% matching funds for carrying out the network design, and design phase program management. We expect this network design phase combined with the time needed to competitively bid for a network implementer/operator to take about 6-9 months.

-In the implementing and operating phase of the network's life (approx 4 years) we plan to use a subscription model in which the eligible sites provide the 15% matching funds from their own funds and a small fee to support program management activities. Given the expected number of sites and our current estimates of the cost per site, we can expect to spend the RHCPP-based funding over the 4 operational years (i.e. the life of the RHCPP).

7. Identify any technical or non-technical requirements or procedures necessary for ineligible entities to connect to the participant's network.

As of now we don't plan to offer service to ineligible entities. We may have a small number of sites who share the broadband facilities (e.g. a local county public health agency sharing with other county departments). We plan to use a "fair share" arrangement to segment the eligible and non-eligible traffic on these "sharing" sites.

8. Provide on update on the project management plan, detailing:

a. The project's current leadership and management structure and any changes to the management structure since the last data report; and

N/A

b. In the first quarterly report, the selected applicant should provide a detailed project plan and schedule. The schedule must provide a list of key project deliverables or tasks, and their anticipated completion dates. Among the deliverables, participants must indicate the dates when each health care provider site is expected to be connected to the network and operational. Subsequent quarterly reports should identify which project deliverables, scheduled for the previous quarter, were met, and which were not met. In the event a project deliverable is not achieved, or the work and deliverables deviate from the work plan, the selected participant must provide an explanation.

The project is divided into three phases with key deliverables in each phase shown below. Completing the first phase is dependent on the delivery of non-RHCPP funding for matching funds and program management funds for that phase. Those funds are currently awaiting the completion of the state's budget process for this year. While work is ongoing in phase 1, we won't have dependable dates for its completion until the non-RHCPP funding noted above is in hand.

Phase 1- formation of RFP for network design (approximately 3-4 months)

Key deliverables:

- -Letters of Agency from the eligible entities
- -NCTN Subscription Agreement from the eligible entities
- -Completed site dataset – with data needed to support network design and needed to support formal demonstration of eligibility.
- - RFP suitable for supporting competitive bidding for the network design process.

Phase 2- Network Design (approximately 3-4 months)

Key deliverables:

- - Completion of competitive bid for RFP for network design; selection of successful bidder.
- - Acquisition of funding commitment letter (FCL) for eligible work done in Phase 1 (forming the RFP), concurrent with
- - Acquisition of FCL for work to be done under the RFP for network design.
- - Completion of Network Design work – including delivery of a draft RFP for NCTN Implementation/Operations

Phase 3- NCTN implementation/operations (approximately four years total with operations starting about 3 months after the start of this phase)

Key deliverables:

- Completion of competitive bid for RFP for network implementation/operation; selection of successful bidder.
- Acquisition of FCL for eligible work to be done as part of network implementation/operation.
- Implementation of services and financial/administrative operations.
- Operation of services and financial/administrative operations.

9. Provide detail on whether network is or will become self sustaining. Selected participants should provide an explanation of how network is self sustaining.

Today, each of the eligible NCTN sites obtains broadband services as an entirely local process- one free clinic at a time, one local health department at a time. This process has risks and limitations that frequently result in sites having inadequate facilities and paying higher prices for those facilities. Generally, the acquisition of these broadband facilities is not coordinated to reduce prices, improve service, or to aid program collaboration among the sites.

Yet, these programs (i.e. in free clinics and local public health agencies) are more frequently seeking to collaborate both on their own initiative and at the urging of their influential partners. The usual goal is to collaborate and cooperate at the program level in order to provide better health-related services at lower costs.

These conditions set the stage for greater cooperation in the area of broadband services among the NCTN subscribers in order to achieve the programmatic results that are being demanded of them now. Therefore, the key areas of cooperation relevant to this NCTN Project are: 1) to work for better value in broadband services per se and 2) for better program services via use of new broadband-dependent technologies at lower costs and to improve the quality of program services for the public. Item 10 below provides more detail on how the use of technology that requires the types of services planned for the NCTN contributes to meeting these program challenges.

This shift towards more need for collaboration among NCTN members, especially in the area of operational information sharing, is the basic motive for a sustainable network. The RHCPP is a way for use to build on that motive. During the RHCPP's life, these sites and other key organizations will work to form and operate the NCTN. Doing so is expected to create the level and type of awareness and understanding needed to continue the NCTN after the RHCPP ends.

As noted elsewhere, we plan to use some of the time and non-RHCPP funds in the early part of the project to explore forming a 501c3. It will likely be titled the NCTN Association – an association of NCTN subscribers. This association could be reasonably expected to provide the organizational focus to continue and expand NCTN operations and do so in a way that can build and leverage a level of expertise and buying power in the area of broadband services for non-profit health facilities. Such an organization would also be well positioned to respond to the changes in FCC policy that the RHCPP is designed to foster. We expect that two likely (and welcomed) FCC policy changes fostered by the RHCPP will be: A) embellished support for discounted broadband services for public and non-profit health care providers to the extent of available funds and B) greater usage of available funds by a policy of supporting the distribution and usage of the funds through consortia of eligible entities such as the NCTN Association.

With these trends and needs in mind as motives, the NCTN Association can be reasonably expected to combine discount support, volume buying power, and expertise under the management of the public and non-profit health care providers/subscribers to create, evolve, and operate the NCTN in a sustainable manner.

10. Provide detail on how the supported network has advanced telemedicine benefits:

a. Explain how the supported network has achieved the goals and objectives outlined in selected participant's Pilot Program application;
b. Explain how the supported network has brought the benefits of innovative telehealth and, in particular, telemedicine services to those areas of the country where the need for those benefits is most acute;
c. Explain how the supported network has allowed patients access to critically needed medical specialists in a variety of practices without leaving their homes or communities;
d. Explain how the supported network has allowed health care providers access to government research institutions, and/or academic, public, and private health care institutions that are repositories of medical expertise and information;
e. Explain how the supported network has allowed health care professional to monitor critically ill patients at multiple locations around the clock, provide access to advanced applications in continuing education and research, and/or enhanced the health care community's ability to provide a rapid and coordinated response in the event of a national crisis.

The NCTN has not started operation, but has already produced some telemedicine benefits. Notably, the exploration of the NCTN scope has raised awareness among a critical mass of players of the near-term need for higher bandwidth and more reliable connections for the vast majority of NCTN participants.

While the NCTN design will be a network with broad telemedicine capabilities, there are four "killer apps" that the NCTN will support. These four applications also can be instrumental parts of other telemedicine applications (e.g. teleconsulting, tele-education). A short description of these four applications will do the most to illustrate these key concrete NCTN-based telemedicine benefits.

1) The Health Information System (HIS) for NC Public Health Agencies. This new system is essentially a centrally provided Electronic Medical Record system including components used during clinical visits (e.g. patient encounter data entry) as well as real-time elements to support administrative needs (e.g. appointing, claims). It is intended to rollout in late 2008 to early 2009. The HIS is designed to provide better client service at lower cost and to provide higher quality health care services through better availability and integrity of relevant patient information. The centrally served architecture of HIS requires that each public health clinic user's workstation have an active session with the central servers (in Raleigh NC) whenever the system is being used. This, of course, implies that the network between the workstation and the central server must be available and responsive.

When the broadband network is not available or is not responsive, the repercussions range from slowed clinic work to closing clinics with attendant effects on patients from delay in care, economic effects from lost job revenue (as patients are delayed or come back for additional appointments),and loss/delay of job revenue for clinic workers when clinics close. Even the low end of these potential effects (e.g. slowed clinics) is likely disruptive enough that most clinics would abandon or minimize the

use of HIS until a reliable and responsive network could be put in place. So, for this critical application, an NCTN-like service is an essential need.

When the HIS system well established, the ability to serve the public in clinics, to share a patient's information quickly and accurately with patient's other providers will be established. Having this ability to share data quickly and accurately is an essential part of many types of traditional telemedicine applications – especially telemedicine-based referrals. So, the success of HIS is a good building block for other telemedicine applications as well as bringing benefits on its own.

2) NCAFC EMR – The NC Association of Free Clinics' information systems strategy includes a commitment to create and operate a centrally served EMR for its approximately 76 member sites to support better care and lower care costs. As in the HIS case, there is a need for a higher-bandwidth and more reliable broadband connection than most free clinics now have. As in the HIS case, the failure to meet these network needs will almost certainly result in disruption of clinic services followed by rejection of the system and delay of reintroduction of the EMR until adequate broadband connections can be obtained and financed. The same logic about the EMR being a building block and supporting other telemedicine applications applies to this EMR as it did for the HIS.

3) LHD DISASTER RESPONSE – Over the last few years, several networked information tools have been developed to support the coordination of public health response service during public disasters (e.g. hurricanes, floods, tornadoes, ice storms, bio-events). Many of these events by their nature are likely to disrupt ordinary broadband services. Currently, most local health departments depend on ordinary broadband services for their access to these networked disaster tools and depend on a growing list of networked information services that are needed at all times (e.g. HIS). Local health departments are thus at risk of not being able to gain the benefit of these tools at the point in time that they are most needed- during a disaster. The NCTN will be designed to support operations using these tools under these circumstances.

This enhanced level of network reliability will likely have a secondary effect on the value gained from all applications: the willingness to (rationally) depend on the network being up and responsive will encourage all users to develop and use higher-value program elements. For example, if you are going to design a program to provide remote telemedicine consults in medical emergencies (e.g. using echocardiography to evaluate newborns in distress), you can rationally base the program design only on a very highly reliable network. If implementing this tele-consulting application included gaining access to a patient's records in HIS, the benefit of the reliability of the network supporting the HIS access would be higher, though the costs would not go up.

4) NCAFC VOIP – Part of the NCAFC's information services strategy calls for the use of voice over IP services as the mainstay for voice services at the 76 free clinics. This is envisioned as a way to add services and lower costs. But, this can only be done with a broadband network with sufficiently low latency and high reliability. Ordinary broadband, especially in rural areas, does not routinely have these qualities at a sufficient level to support this use. The NCTN is the mechanism that is designed to provide these qualities.

11. Provide detail on how the supported network has complied with HHS health IT initiatives:

a. Explain how the supported network has used health IT systems and products that meet interoperability standards recognized by the HHS Secretary;
b. Explain how the supported network has used health IT products certified by the Certification Commission for Healthcare Information Technology;
c. Explain how the supported network has supported the Nationwide Health Information Network (NHIN) architecture by coordinating activities with organizations performing NHIN trial implementations;
d. Explain how the supported network has used resources available at HHS's Agency for Healthcare Research and Quality (AHRQ) National Resource Center for Health Information Technology;
e. Explain how the selected participant has educated themselves concerning the Pandemic and All Hazards Preparedness Act and coordinated with the HHS Assistant Secretary for Public Response as a resource for telehealth inventory and for the implementation of other preparedness and response initiatives; and
f. Explain how the supported network has used resources available through HHS's Centers for Disease Control and Prevention (CDC) Public Health Information Network (PHIN) to facilitate interoperability with public health and emergency organizations.

While the NCTN is not operational yet, our plan for the NCTN design, implementation, and operation to support these initiatives is formed. Notably:

- We plan to require NCTN products/services that meet the interoperability standards recognized by HHS. We will encourage the use of such products for those who operate services that use such products over the NCTN (e.g. HL7 in health data transmissions).

- CCHIT does not yet certify products that the NCTN would directly use, but CCHIT standards require the use of various open networking protocols (e.g. SSL, IPSec) by those who may use CCHIT-certified products (e.g. EMRs) in ways that employ the NCTN (e.g. movement of lab results). Our plan is for the NCTN to support these open protocols to allow CCHIT products to operate in a certified way and to encourage the adoption of CCHIT products among NCTN subscribers.

- Many of the principal actors in forming the NCTN are also active members of organizations involved in the NHIN trials. Notably, CHA, the NC Association of Local Health Directors, the NCAFC, the NC Division of Public Health, and KirbyIMC are all active members of NCHICA (the North Carolina Healthcare Information and Communication Alliance). NCHICA is one of the NHIN Trial Implementers and this group of NCHICA members has been active in forming and following the approach to this NHIN-centric work and other related projects.

- The AHRQ's HealthIT site is a great resource for the evidence base for the use of information in health-related activities. Many of these activities include broadband networks. But, the AHRQ site does not seem to have much helpful material associated with designing or operating broadband nets to support these uses. The site's data will likely be of much more use to us as various NCTN users focus on the types of uses of broadband that are the mainstay of this web site.

- With regard to the Pandemic All Hazards Preparedness Act, we have made direct contact with the Asst. Secretary to request his guidance, which is pending. In the interim, we plan to include supportive elements in the NCTN design. Note that the reliability measures in the NCTN will include high reliability in the face of pandemics

that may significantly reduce availability of the workforce that maintains broadband facilities – especially in rural areas.

- With regard to the CDC's PHIN, we have included on our team the North Carolina PHIN Compliance Coordinator and plan to use his inputs to assure that the NCTN can support PHIN-compliant applications.

12. Explain how the selected participants coordinated in the use of their health care networks with the Department of Health and Human Services (HHS) and, in particular, with its Centers for Disease Control and Prevention (CDC) in instances of national, regional, or local public health emergencies (e.g., pandemics, bioterrorism). In such instances, where feasible, explain how selected participants provided access to their supported networks to HHS, including CDC, and other public health officials.

Most of the NCTN public health agency sites and even many of the free clinics are expected to be operational during a disaster both for normal services and in support of disaster response. Many public health sites are also community centers for disaster response – partnering with other government units (e.g. the county sheriff's office) and NGOs (e.g. the Red Cross). So, being involved in preparing for, training for, and executing disaster response is part of the basic mission of most NCTN subscribers. One key NCTN team member – the NC Division of Public Health – has an overall coordination role in the area of public health emergencies and generally requires the close cooperation of local health departments (all of which are expected to be NCTN members) in carrying out this role.

To date, our main form of specifically assuring that the NCTN can support use of the network by HHS, CDC, and other public health officials has been to make PHIN compliance a basic goal and to involve the state's PHIN coordinator as a project team member. As the design details are filled in and the network is implemented and operated, we will call on this partnership to assure that the needs to support response to public health emergencies are fulfilled.